GOVT.DEGREE COLLEGE
PORUMAMILLA

Y.S.R.DISTRICT

DEPARTMENT OF BOTANY

BRIDGE COURSE

2021-22

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BRIDGE COURSE

Enlightenment of curriculum and its objectives, additional curricular inputs, co-curricular and extra-curricular inputs and teaching methodology to the students in the few introductory classes can be stated as "**Bridge Course**"

The purpose of conducting the bridge course is to bridge the gap between intermediate course and under graduate course. The teacher enlightens the students about the curricular aspects and innovative aspects related to the curriculum. So that the students feel that they have familiarity with the subjects and with the subject related topics. Further the bridge course gives scopes to the students to understand the curriculum well without any hesitation and ambiguity.

Conducting the **Bridge Course** to the students is one of the **Healthy Practices.**

Introduction:

The plant kingdom has been divided into two major divisions

I. **Cryptogams :** these are lower plants which do not bear, flowers or seeds and hence are commonly known as **flowerless** or **seedless** plants

II.:**Phanerogams:** These includes advanced types of vascular plants which always bear flowers and seeds . these are commonly known as flowering plants or seed plants. These are divided into two sub- divisions.

1. Gymnospermae-naked seeded plants
2. Angiospermae- seed covered by the fruit wall.

The cryptogams are broadly classified into three groups

1.Thallophyta

2.Bryophyta

3. Pteridophyta

THALLOPHYTA

The thallophyta (GK.Thallus=Young shoot) is a collection of plants, lowest in development, which have least differentiation of vegetative bodies and having simple methods of reproduction.

1. The Plant body is known as thallus which is not differentiated into true root, stem and leaves.
2. The thallus may or may not be surrounded by a wall
3. The thalli may range from microscopic unicellular forms to macroscopic multicellular forms.
4. The plants are non-vascular.
5. The reproductive organs simple and invariably unicellular, usually not enclosed by jacket of sterile cell.
6. They do not bear embryo-stage in the life-cycle which is dependent on parent generation for nourishment.
7. They may be chlorophyllus or achlorophyllous.

The thallophyta is divided into two sub-divisions, the **Algae** and **Fungi**

S.No	Algae	Fungi
1	They are mostly aquatic found in fresh as well as marine water	Most of the fungi are terrestrial, grow mostly on land where organic matter is present
2	The thallus is uni-or multicellular, which is not differentiated into root, stem and leaves	The thallus is simple, unicellular or multicellular and is known as mycelium.
3	Algae contain chlorophyll, hence they are autophytes.	Fungi are heterophytes, as they lack chlorophyll.
4	They cell wall is mainly composed of cellulose, hemecellulose and pectin.	The cell wall is made up of Chitin, or nitrogenous fungus cellulose
5	The food reserve in algae is frequently in the form of starch.	The reserve food is accumulated in the form of **Glycogen** and oil **globules**

GENERAL CHARACTERS OF ALGAE

Algae are chlorophyll bearing thalloid organisms .The plants may be microscopic as well as macroscopic, unicellular or multicellular. The algae are known to mankind from time immemorial as food and fodder. In latin, the word Algae means seaweed. The study of algae is called phycology and those who pursue research work on them are phycologists.

The algae included about 30,000 species distributed all over the world. They are found in fresh as well as sea water , on soil, on rocks and within the plants, snow covered solar region and in deserts. On the basis of the habitat the algae may be divided into three major groups

1. **Aquatic algae**
   - i. Fresh water algae
   - ii. Marine water algae
   - iii. Phytoplanktons
   - iv. Benthos
2. **Terrestrial algae**
3. **Algae of unusual habitats**
   - i. Cryophytic algae
   - ii. Epiphytic algae
   - iii. Epizoic algae
   - iv. Endozoic algae
   - iv. Symbiotic algae

RANGE OF THALLUS STRUCTURE

The thallus structure is basically of two types, the unicellular and the multicellular forms.thge algae exhibit variations as a result of modification or elaborations of these types.

1. Unicellular forms

i. Motile unicellular

ii.Non motile or coccoid forms

2.Colonial

Coenobium

i. Palmelloid colony

ii. Dendroid colony

iii. Rhizopodial colony

3. Filamentous forms

i. Unbranched filaments

ii. Branched filaments

iii.Heterotrichous forms

iv.Siphonous forms

4. Pseudoparenchymatous

5. Parenchymatous

CELL STRUCTURE IN ALGAE

On the basis of their cell organisation, algal cells are of two types-prokaryotic, eukaryotic types. The prokaryotic cell is found in Cyanophyceae. A eukaryotic cell is characterized by the presence of well organised nucleus membrane bound organells like Plastids, Mitochondria and Golgi bodies. An intermediate type cell organisation i.e Mesokaryotic structure is found in members of Dinophyceae. Hence the nucleus is present, but chromosomesare without histone proteins.

The following are the cell components

1.Cell wall

2.Flagella

i. Whiplash or acronematic flagella

ii. Tinsel or pleuronematic flagella

a. Pantonematic

b.Stichonematic

c. Pantocronematic

3.Plastids and chromatophores

4.Pigments

i. Chlorophylls

ii.Carotenoids

a. Xanthophylls

b. Carotenes

iii.Phycobilins

5.Pyrenoids

6.Storage products

7. Golgi bodies

8.Mitochondria

9.Vacuoles

10. Eye-spot or stigma

11. Nucleus

REPRODUCTION IN ALGAE

Reproduction in algae takes place by vegetative, asexual and sexual

Vegetative reproduction

1. Fission or cell division
2. Fragmentation
3. Hormogonia
4. Adventttious branches

Asexual reproduction

The daughter protoplasts are called spores and the cell producing spores is called sporangium. The sporangia may be similar to vegetative cells or may be specialised. Varies spores are

1. Zoospores
2. Aplanospores
3. Akinetes
4. Tetraspores
5. Auxospores

Sexual reproduction

Sexual reproduction occurs in all groups of algae except blue green algae

Depending upon the types of gamets involved in fusion, sexual reproduction is of the following types

1. Isogamy
2. Physiological anisogamy
3. Anisogamy
4. Oogamy

FUNGI

Introduction

The fungi(singular –fungus) are eukaryotic, spore-bearing achlorophyllous and heterotropic thallophytes. The plant body consists mostly of thallus, made up of hyphae, which together constitute the mycelium. The study of fungi is known as mycology (Gr. makes= mushroom +logos =study) and the scientist who is concerned with fungi is called mycologist. The systematic study of fungi began with the work of pier Antonio Micheli (in1791) an Italian botanist. He is popularly known as the father of mycology.

OCCURRENCE

At present about 5,100 genera and morethan50, 000 species of fungi are known. They are ubiquitous and grow in wide variety of habitats. They occur in water, in soil, in air and in and upon the dead and living bodies of plants and animals. Som efungi form symbiotic association with algae to form lichens and with the roots of higher plants to form mycorrhizae.

STRUCTURE

The vegetative body of fungus is thalloid i.e it is not differentiated into roots , stem and leaves . on the basis of thallus fungi can be divided into two broad caterogories. Unicellular fungi and Mycelial fungi.

Non-mycelial unicellular fungi

In a large number of simple fungi the thallus is made up of a single microscopic cell, ranging from a few to few hundred microns in size. The cell may be spherical, ellipsoidal, tubular or irregular in shape. In some fungi, the entire thallus becomes transformed, on maturity into a single reproductive structure (holocarpic monocentric)or into several reproductive structures (holocarpic polycentric). On the other hand thallus of other unicellular fungi is differentiated into vegetative and reproductive portions. Such thalli are called **eucarpic.** The vegetative portion may consist of narrow, delicate, root like rhizoids or may consist of an extensive system of hyphe- like filaments, called the Rhizomycelium. If the rhizomycelium bears several reproductive units, it is called eucarpic polycentric.

Mycelial fungi:

In most of the fungi, thallus is made up of thin-walled , transparent, branched or unbranched, tubular filaments called hyphae. The net work of hyphae constituting the body of fungus is called mycelium.

ULTRA STRUCTURE OF THE FUNGAL CELL

Fungal cells are typically eucarotic and lack chloroplast. The thallus in fungi is enclosed by ragid cell wall, which expands continuously during growth. Chemically, the cell wall is made up of 80-90 percent of polysaccharides along with the proteins, lipids and inorganic ions. Physically the fungal cell wall is composed of inter woven micro fibrils of cellulose and chitin. Chitin is characteristically present in the cell walls of most fungi including oomycetes, a group in which chitin was thought to be absent a few year ago. In most true yeasts, the skeletal part of cell wall is composed of non –cellulosic mannan glucan complex.

Chitin is a linear polymer of N-acetyl β-glucosamine units linked by β 1, 4 glycosidic bonds. N-acetyle-glucosamine is also present in the bacterial cell walls along with N-acetyle muramic acid. Cell organells like **Endoplasmic Reticulum, Mitochondria, Golgi Complex, Ribosomes, Vacuoles, Vesicles, Lysosomes, Microbodies, Microtubules and Nuclei** are present in the cytoplasm. Ribosomes occur both in the cytoplasm and also in mitochondria. The nuclei is surrounded by anuclear membrane that is two layered with nuclear pores.

NUTRITION

Fungi are heterotrophs as they are dependent on external supply of food material. Fungi are usually grouped in to the following three categories on the basis of their modes of nutrition.

Parasites: These fungi obtain their nourishment from other living plants or animals.

Saprophytes: These fungi obtain their nutrition from dead and decaying organic matter.

Symbionts: awide variety of fungi appear to be unable to live as saprophyte or parasite. Such fungi grow on other living organisms as symbionts. Such as association is known as symbiosis. Lchens and mycorrhiza are common examples of symbionts.

GROWTH

The mycelium begins life as a germ tube when the spore germinates. The fungal hyphae and sporangispores grow apically and this is called primary growth. The optimum temperature for growth is 20-30^{0}C. the optimum pH for their growth is 6.0. Light is not required for the growth of the fungi but is required for sporulation and spore dispersal. Majority of fungi are inhibited by high concentrations of CO_2 All fungi require some aerobic oxygen for growth.

REPRODUCTION

Reproduction is the formation of new progeny by vegetative, asexual or sexual means.

I.Vegetative reproduction

1. Fragmentation
2. Fission
3. Budding
4. Oidia or arthrospore
5. Chlamydospores:

II. Asexual reproduction:

1. Zoospores

The bridge course is conducted to the I B.Sc students in algae and fungi in the following dates

S.No	Dates	Subjects4
1	4-08-2023	Introducing and importance of Botany
2	5-08-2023	Introduction of Algae
3	6-08-2023	Introduction of Algae
4	7-08-2023	Introduction of Fungi

Signature of lecturer

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